

Appendix 10-E

ACCESS MANAGEMENT PLAN: BLUFFTON PARKWAY

BLUFFTON PARKWAY: PHASE FOUR TOWN OF BLUFFTON & BEAUFORT COUNTY, SC

Prepared for:

Beaufort County &
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INTRODUCTION & PROJECT OVERVIEW

INTRODUCTION

SRS Engineering, LLC (SRS) has been retained by a combination of the Beaufort County Engineering and the Town of Bluffton Planning Departments to complete an analysis of the westerly segment (Phase 4) of the Bluffton Parkway which is an existing/under construction east/west orientated major arterial located in Southern Beaufort County.

As planned by the County's Comprehensive Plan, the Bluffton Parkway will provide a multi-lane divided facility between SC 170 and US 278. This facility is anticipated to serve as an alternative route for both US 278 and SC 46 which are currently the only east/west orientated major roadways in southern Beaufort County. Eventually, it is thought that the Bluffton Parkway will extend west of SC 170 in Beaufort County into Jasper County and eventually access I 95 either directly via a new interchange or indirectly via an existing interchange. This planning is underway as a joint effort between Beaufort and Jasper County's. With or without this extension toward I 95, the importance of the Bluffton Parkway as an east/west corridor is imperative in order to provide for the ability of existing and future traffic flow through southern Beaufort County.

PROJECT OVERVIEW

The segment of the Bluffton Parkway to be studied in this report is the westerly portion of the Parkway referred to as Phase 4. In total, this segment is approximately 2.6-miles in length beginning at the intersection with SC 170 and ending at the intersection with the Buckwalter Parkway. The easterly termini for this report has been assumed to be the recently planned realignment of the Bluffton Parkway where the Phase 4 segment will intersect the Buckwalter Parkway in the form of a 4-legged signalized intersection, opposite the Phase 5B segment resulting in the Bluffton Parkway as a continuous east/west orientated roadway.

The purpose of this study is to review this segment of the Bluffton Parkway (Phase 4) and define appropriate locations for development access which will be concentrated at signalized intersections. By properly planning these access points and strategically locating future signals along this corridor, the greatest roadway capacity will be achieved while providing good access to development which will be forth coming in the near future. **Figure 1** illustrates the general section of the Bluffton Parkway studied within this report.

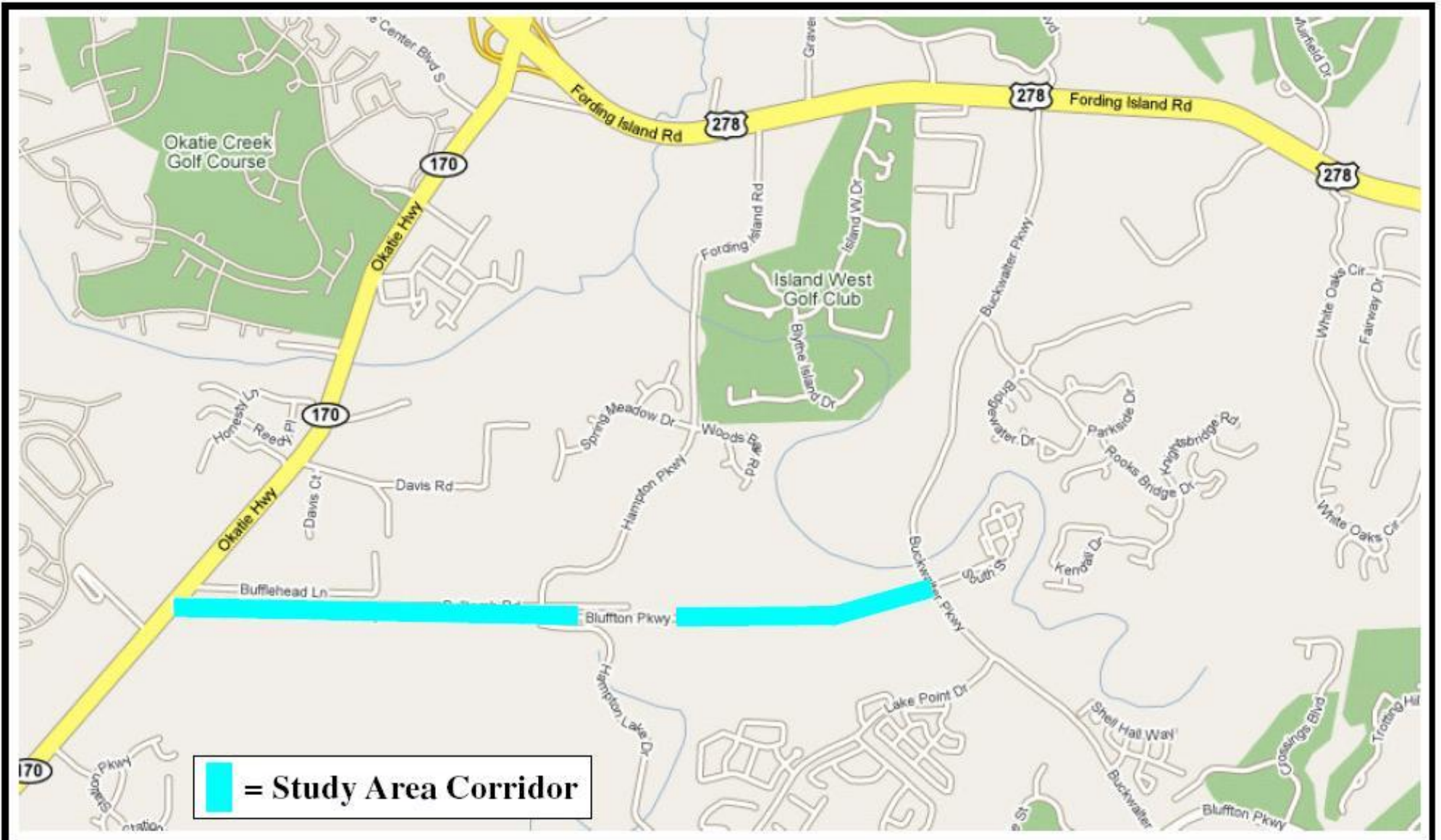


Figure 1

STUDY AREA LIMITS

Bluffton Parkway Access Management: Bluffton, SC

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FUTURE CONDITIONS

To estimate the traffic flow conditions under Future conditions, the County's newly updated transportation model has been utilized which reflects the anticipated traffic loadings for the Year 2025. Traffic volumes on the roadway network at this time will include all existing traffic, traffic due to normal growth and traffic due to anticipated development in the area as well as all planned roadway improvements anticipated to be completed as stated in the County's transportation plan/model.

TRAFFIC VOLUME PROJECTIONS

The daily traffic volume projections were obtained from the County's Transportation model for the year 2025 for the segment of the Bluffton Parkway being studied.

According to the County's Transportation model, the Phase 4 segment of the Bluffton Parkway is anticipated to serve between 22,000-26,000 vehicles per day (vpd). **Table 1** depicts the daily volumes for the Bluffton Parkway as are contained in the County's E+C (existing plus committed) model assignment. For comparative purposes; the adjacent roadways/segments of US 278 to the north and SC 46 to the south (parallel to the Bluffton Parkway Phase 4) have also been presented.

Table 1
2025 DAILY TRAFFIC VOLUMES
Buckwalter Parkway Access Management

Arterial Roadways	Segments	Daily Two-Way Traffic Volume (vpd)¹
Bluffton Parkway	Between SC 170 and Hampton Parkway	22,865
	Between Hampton Parkway and Buckwalter Parkway	26,630
US 278	Between SC 170 and Hampton Parkway	87,001
	Between Hampton Parkway and Buckwalter Parkway	85,127
SC 46	West of Old Miller Road	20,449
	East of Old Miller Road	20,630

1. Source: WSA Transportation Model completed for Beaufort County.
vpd=Vehicles-per-day.

As shown by the table, the fourth phase of the Bluffton Parkway is anticipated to serve a high of 26,630 vpd within the defined study area. However, it should be noted that just to the east of the study area, the daily volume is expected to increase to 32,200 vpd (east of the Buckwalter Parkway). Other volumes in the area indicate that US 278 is expected to serve over 87,000 vpd in the vicinity of McGarvey's Corner and SC 46 is anticipated to be greater than 20,000 vpd west of the Buckwalter Parkway intersection.

TRAFFIC OPERATIONS

To assess quality of flow, capacity analyses were conducted to provide an indication of how well the study area intersections and roadway segments are anticipated to serve future traffic demands. The following provides a description of the methodology utilized to complete these analyses.

Roadway Segments

The determination of how a roadway segment serves traffic is an investigation of multiple factors including roadway geometry, number of operating lanes, provision of auxiliary lanes (left-turn & right-turn), traffic volumes and directional splits of traffic, access drives per mile, and the separation of signalized intersections. These factors result in an assignment of arterial speed and level of service which is used to assess the roadway operations.

In reviewing the existing and future roadway system within southern Beaufort County, three important east/west corridors are prevalent; US 278 and SC 46 as existing facilities and the Bluffton Parkway as a proposed facility. These three roadways, according to the County's transportation model will serve a total of over 134,000 vpd in the western region of southern Beaufort County. Given the importance of serving traffic flow via the east/west orientated corridors, it can be determined that all three of the corridors are extremely important to the flow of traffic through the area where the Bluffton Parkway is the second most used facility (based on the estimates) which will require proper planning and intersection spacing in order to serve the estimated flows.

Signalized Intersection Spacing

The proper spacing of traffic signals along the Bluffton Parkway will be critical so that the corridor can provide the greatest/most efficient capacity possible. Without proper spacing, vehicle queues may be created which back into/through adjacent intersections resulting in a "gridlock" pattern which causes a significant degradation in roadway capacity and traffic flow. According to access management guidelines, the ideal spacing of signalized intersections along a major arterial such as the Bluffton Parkway is ideally 2,640-feet or a 1/2-mile (ref. *Access Management Manual*, TRB). This separation provides a progression speed ranging between 30 and 40 miles-per-hour (mph).

However, this spacing may not be achievable in all circumstances due to constraints such as topography, environmental issues/wetlands, etc. While the most advantageous separation is 1/2-mile and should be provided if feasible, shorter separation distances of 1,500-1,700-feet will allow progressions speeds along the Bluffton Parkway that are in the 30 mph range.

In planning signal locations, one must also account for the classification of roadways that intersect the corridor. For instance, when intersecting a major roadway/arterial which presumably serves a large volume of traffic, separation to the next adjacent intersection(s) is extremely important so that vehicle speeds and resulting queues/stacking do not interfere with the operations of adjacent traffic signal.

Review of the Bluffton Parkway corridor and the limited number of submitted traffic studies begins to identify some logical intersections for installation of traffic signal control when/if the intersection meets the criteria for traffic signal control (warrants). Three intersections are obviously going to be placed under traffic signal control; the intersection of Bluffton Parkway at SC 170, Bluffton Parkway at Hampton Hall and Bluffton Parkway at Buckwalter Parkway. Between these three obvious intersections, additional points of access will be required which will be both signalized and unsignalized intersections. Signalized intersections should provide separation distances as suggested in prior sections of this report. In planning the location of major intersections along the Bluffton Parkway, requested/conceptual drive locations as well as major wetland locations were reviewed/accounted for. **Table 2** depicts the approximate spacing of anticipated major intersections along the Bluffton Parkway using SC 170 as the starting point.

Table 2
MAJOR (SIGNALIZED) INTERSECTION SPACING
Bluffton Parkway Access Management

Corridor	Major Intersecting Cross Streets (Signal Locals)	Separation (Feet)	Cumulative Distance to SC 170 (Feet)
Bluffton Parkway	SC 170	0	0
	Lawton Station Access (Relocated East)	1,750	1,750
	Sandhill Tract	2,100	3,850
	Hampton Parkway	2,450	6,300
	Parcel 10B	2,550	8,850
	Parcel 12A & 12 B	2,600	11,450
	Buckwalter Parkway	2,200	13,650

As shown, seven major intersections are planned/suggested along this section (Phase 4) of the Bluffton Parkway. Given that the entire corridor being studied is approximately 13,650-feet (2.6-miles), the suggested separation of the major intersections is typically between 2,000-feet to 2,600-feet with the exception of the distance between SC 170 and the Lawton Station access (1,750-feet). It should be noted that it is suggested that the Lawton Station access be located as far to the east in order to obtain a maximum separation from SC 170 as is possible.

While the separation between the Lawton Station access and SC 170 is approximately 1,800-feet, which is less than the ideal ½-mile spacing, the location of this potential signalized intersection will provide access to multiple parcels/developments on both the north and south side of the Bluffton Parkway. If located further to the east, the ideal separation distances to the intersection with Hampton Parkway would be impacted.

As these intersections are planned, it is imperative that the approaches to the Bluffton Parkway provide sufficient width and geometry to accommodate future traffic loadings. Implementation of traffic signal control should only be considered after a detail study has been completed which identifies that a traffic signal is warranted. Under no circumstances should a future intersection, which will be signalized, permit/allow split phasing for the minor street approaches. This can be avoided by providing sufficient driveway widths, storage length and throat lengths. Approaches should account for the fact that each signalized intersection will be a four-legged intersection and that through movements should be made from a separate lane. Under all circumstances, left-turn and right-turn deceleration lanes should be provided along/within the Bluffton Parkway at each signalized intersection. If needed/warranted, dual left-turn lanes may be needed depending on the development specifics of a particular site.

DEVELOPMENT ACCESS/CONNECTIVITY

In order to maintain traffic flow on the Bluffton Parkway, the location of signalized intersections must be properly planned and maintained. As such, not all access points will be allowed signalization at “front door” locations along the frontage of the site.

With this, the planning of limited access/unsignalized access points and good connectivity between developments is critical so that drivers can travel from one facility to another without having to get on the Bluffton Parkway and to allow access for traffic to one of the planned signalized intersections.

Connectivity is especially important for many of the parcels along the Bluffton Parkway due to development parcel size and environmental constraints. For parcels which front US 278, connectivity to the Bluffton Parkway is critical as the approved access plan for US 278 limits full-access movement drives and signalized intersections.

Unsignalized Access Points

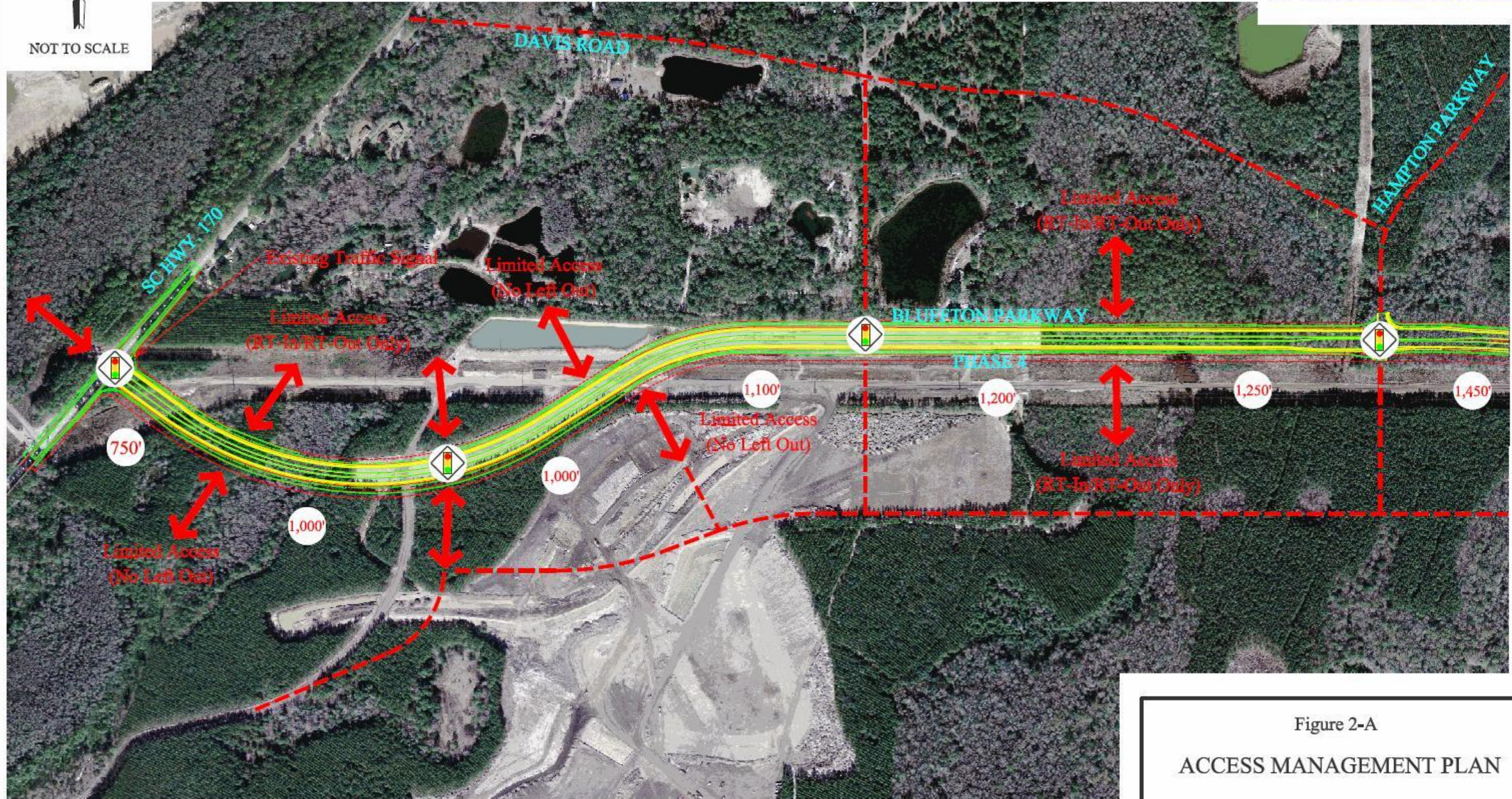
In addition to the planning of signalized intersections, locations for unsignalized intersections have also been identified along the length of the corridor. In general, these suggested locations are located between the suggested locations of the traffic signals and will presumably prohibit left-turns from the minor street approaches at a minimum. **Table 3** illustrates the location of each access along the Phase 4 segment of the Bluffton Parkway.

Table 3
INTERSECTION SPACING
Bluffton Parkway Access Management

Corridor	Intersecting Cross Streets	Separation (Feet)	Cumulative Distance to SC 170 (Feet)
Bluffton Parkway	SC 170	0	0
	Parcels 8B-1& 8C (Right-In/Right-Out North Side, Right-In/Right-Out/Left-In South Side)	750	750
	Lawton Station Access	1,000	1,750
	Right-In/Right-Out/Left-In	1,000	2,750
	Sandhill Tract	1,100	3,850
	Right-In/Right-Out	1,200	5,050
	Hampton Parkway	1,250	6,300
	Parcel 10C (Right-In/Right-Out)	1,450	7,750
	Parcel 10B	1,100	8,850
	Parcel 10B (Right-In/Right-Out/Left-In)	1,350	10,200
	Parcel 12A & 12B	1,250	11,450
	Sandy Pointe Connection (Right-In/Right-Out)	1,500	12,950
	Buckwaller Parkway	700	13,650

Suggestions to provide for and/or enhance connectivity and allow access to/from developments are depicted by **Figure 2-A** and **B** for the Bluffton Parkway Phase 4 segment and briefly described below:

NOT TO SCALE



MATCHLINE - SEE FIGURE 2-B

Figure 2-A
ACCESS MANAGEMENT PLAN
*Bluffton Parkway: Phase 4
Bluffton, SC*

NOT TO SCALE

MATCHLINE - SEE FIGURE 2-A

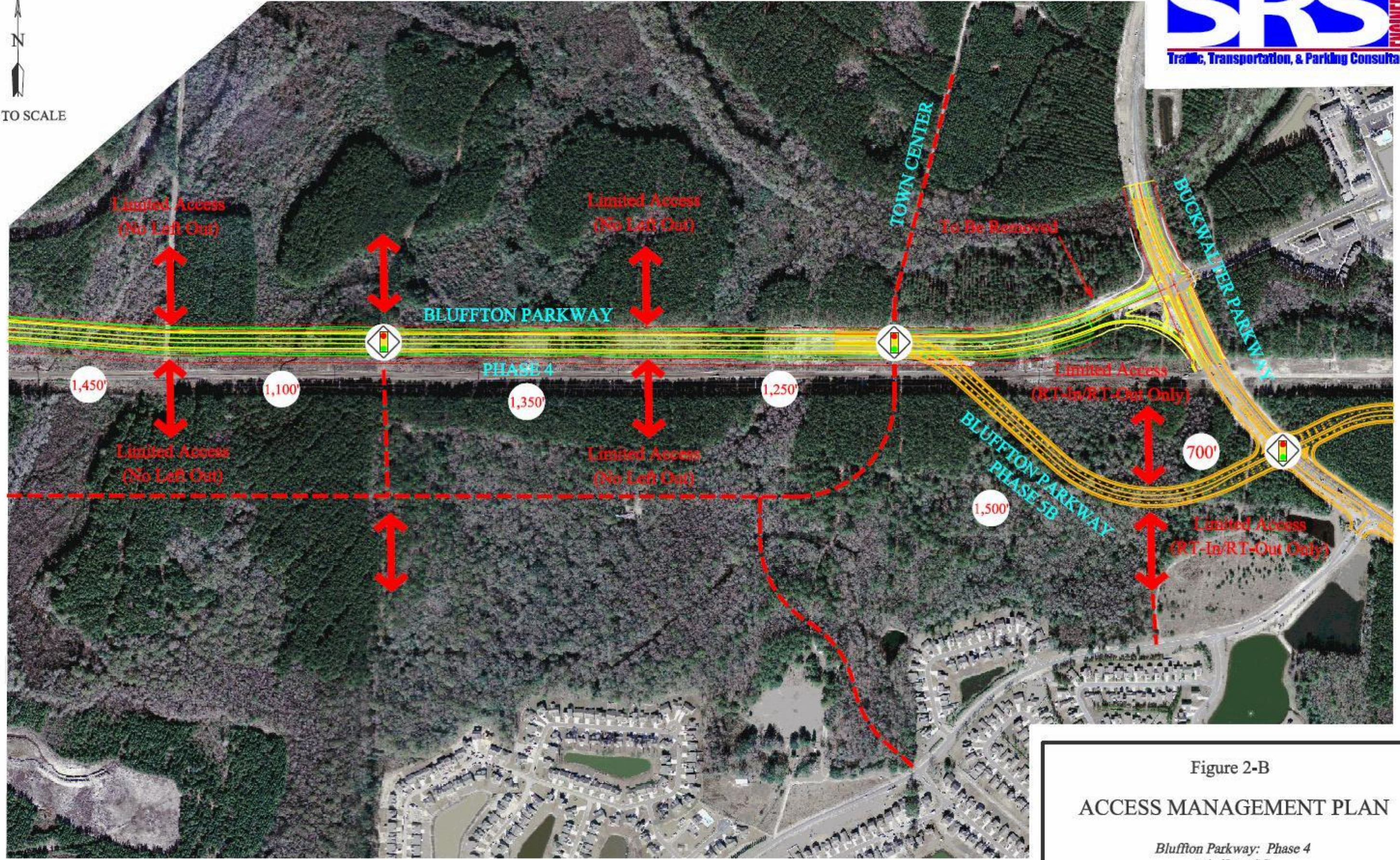


Figure 2-B
ACCESS MANAGEMENT PLAN
Bluffton Parkway: Phase 4
Bluffton, SC

- **Parcels 8B-1 & 8C-** A new intersection to be planned as part of the development along the eastern side of SC 170. This access is planned to be located approximately 750-feet east of SC 170 and will be an unsignalized intersection due to its proximity to the planned signalization of the SC 170 intersection. Based on the location of this access, the access drives that this development proposes to SC 170 and the connectivity suggested to the Lawton Station access, this access should be restricted to right-in/right-out movements only on the north side of the Bluffton Parkway and right-in/right-out/left-in (westbound left-turn only). Full access or signalization of this intersection would result in safety and capacity constraints at this intersection and the adjacent signalized intersection of SC 170. This will be especially evident if/when the Bluffton Parkway is extended towards the west. Vehicles exiting the respective sites on the north and south side of the Bluffton Parkway should be placed under STOP sign control. It should be noted that the westbound left-turn in movement is being allowed while the eastbound left-in is not. The main reasoning for prohibiting the eastbound left-turn is due to the proximity to the SC 170 intersection which is anticipated to provide dual left-turns in the westbound direction which may result in over-lapping left-turns if left-turns are provided in the eastbound direction entering this access.
- **Unsignalized Access (Undefined)-** A new intersection planned between the two signalized intersections of Lawton Station and Hampton Lake. This access is planned to be located approximately 1,000-feet east of the Lawton Station access and will be an unsignalized intersection. This access should be restricted to right-in/right-out and left-turn in movements only (prohibit left-turns out from the minor approaches). Vehicles exiting the respective sites on the north and south side of the Bluffton Parkway should be placed under STOP sign control.
- **Unsignalized Access (Undefined)-** A new intersection planned between the two signalized intersections of Hampton Lake and Hampton Parkway. This access is planned to be located approximately 1,200-feet east of the Hampton Lake access and will be an unsignalized intersection. This access should be restricted to right-in/right-out movements only (prohibit left-turns out from the minor approaches). Vehicles exiting the respective sites on the north and south side of the Bluffton Parkway should be placed under STOP sign control.
- **Parcel 10C-** A new intersection planned between the two signalized intersections of the Hampton Parkway and Parcel 10B. This access is planned to be located approximately 1,450-feet east of the Hampton Parkway and will be an unsignalized intersection. This access should be restricted to right-in/right-out and left-turn in movements only (prohibit left-turns from the minor approaches). Vehicles exiting the respective sites on the north and south side of the Bluffton Parkway should be placed under STOP sign control.
- **Parcel 10B-** A new intersection planned between the two signalized intersections of the Parcel 10B and the proposed Bluffton Technical Center. This access is planned to be located approximately 1,350-feet east of the parcel 10-B signalized intersection and will be an unsignalized intersection. This access should be restricted to right-in/right-out and left-turn in movements only (prohibit left-turns from the minor approaches). Vehicles exiting the respective sites on the north and south side of the Bluffton Parkway should be placed under STOP sign control.
- **Sandy Pointe-** A new intersection planned 700-feet to the west of the Buckwalter Parkway. This access should be restricted to right-in/right-out movements. Left-turns into the parcel should not be allowed from the Bluffton Parkway due to the proximity of the signalized intersection with Buckwalter Parkway to the east of this access. Vehicles exiting the site on the south side of the Bluffton Parkway should be placed under STOP sign control.

Each of these intersections should be planned/constructed with adequate deceleration lanes along/within the Bluffton Parkway. The restriction of left-turn movements exiting the access drives should be accomplished by three methods; the raised median within the Bluffton Parkway, the construction of a raised delta median within each of the access drives and appropriate signage and stripping.

Connectivity off of the Bluffton Parkway will provide for the ability to move from parcel to parcel and to access traffic signals along the corridor. Examples of a connector roadway are shown along the southerly side of the Bluffton Parkway which will basically extend from Lawton Station to the Sandy Pointe connector at the planned signalized intersection with the Bluffton Technical Center. Other connectivity proposals including the extension of Davis Road to the Hampton Parkway and the connectivity of the Bluffton Technical Center to the Hampton Parkway are indicated by Figure 2.

CONCLUSIONS

This report has been prepared in an effort to plan major access points/signalized intersections along the section of the Bluffton Parkway between SC 170 and the Buckwalter Parkway.

Based on the current configuration, two intersections are recommended for installation of traffic signal control which are the limits of the Phase 4 section of the Bluffton Parkway; SC 170 and Buckwalter Parkway. The planning of access drives between these two signalized has been based on access management practices outlined in the *Access Management Manual*, TRB, 2003 and potential development activity along the Parkway.

A total of seven potential traffic signals have been suggested along this section of the Bluffton Parkway which include the two ends being SC 170 and the Buckwalter Parkway. Given the length of this section of the parkway, the average spacing for each signalized intersection is 2,275-feet or approximately four-tenths of a mile. Between each signalized intersection, potential limited access drives have been suggested which are either limited to right-turn in/right-turn out movements only or in some instances allow left-turns from the major roadway, but prohibiting left-turns from the minor approaches.

Connectivity suggestions have been provided along both the north and south sides of the Bluffton Parkway. Along the south, connectivity is suggested between Lawton Station and the Sandy Pointe sub-division. This connector roadway would be constructed on new location and would be completed as development comes on line. On the north side of the Bluffton Parkway, connectivity is suggested by the extension of Davis Drive to the Hampton Parkway and then by providing a connection from the Technical Center to Davis Drive.

While projections of individual operations at intersections are not possible at this time, it is anticipated that as long as the intersections are planned with appropriate geometrics and cross-sections, operations along this section of the parkway should be good given the daily traffic volumes as projected by the County's transportation model.

